

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100  
101  
102  
103  
104  
105  
106  
107  
108  
109  
110  
111  
112  
113  
114  
115  
116  
117  
118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210  
211  
212  
213  
214  
215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321  
322  
323  
324  
325  
326  
327  
328  
329  
330  
331  
332  
333  
334  
335  
336  
337  
338  
339  
340  
341  
342  
343  
344  
345  
346  
347  
348  
349  
350  
351  
352  
353  
354  
355  
356  
357  
358  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368  
369  
370  
371  
372  
373  
374  
375  
376  
377  
378  
379  
380  
381  
382  
383  
384  
385  
386  
387  
388  
389  
390  
391  
392  
393  
394  
395  
396  
397  
398  
399  
400  
401  
402  
403  
404  
405  
406  
407  
408  
409  
410  
411  
412  
413  
414  
415  
416  
417  
418  
419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438  
439  
440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
450  
451  
452  
453  
454  
455  
456  
457  
458  
459  
460  
461  
462  
463  
464  
465  
466  
467  
468  
469  
470  
471  
472  
473  
474  
475  
476  
477  
478  
479  
480  
481  
482  
483  
484  
485  
486  
487  
488  
489  
490  
491  
492  
493  
494  
495  
496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506  
507  
508  
509  
510  
511  
512  
513  
514  
515  
516  
517  
518  
519  
520  
521  
522  
523  
524  
525  
526  
527  
528  
529  
530  
531  
532  
533  
534  
535  
536  
537  
538  
539  
540  
541  
542  
543  
544  
545  
546  
547  
548  
549  
550  
551  
552  
553  
554  
555  
556  
557  
558  
559  
560  
561  
562  
563  
564  
565  
566  
567  
568  
569  
570  
571  
572  
573  
574  
575  
576  
577  
578  
579  
580  
581  
582  
583  
584  
585  
586  
587  
588  
589  
590  
591  
592  
593  
594  
595  
596  
597  
598  
599  
600  
601  
602  
603  
604  
605  
606  
607  
608  
609  
610  
611  
612  
613  
614  
615  
616  
617  
618  
619  
620  
621  
622  
623  
624  
625  
626  
627  
628  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
640  
641  
642  
643  
644  
645  
646  
647  
648  
649  
650  
651  
652  
653  
654  
655  
656  
657  
658  
659  
660  
661  
662  
663  
664  
665  
666  
667  
668  
669  
670  
671  
672  
673  
674  
675  
676  
677  
678  
679  
680  
681  
682  
683  
684  
685  
686  
687  
688  
689  
690  
691  
692  
693  
694  
695  
696  
697  
698  
699  
700  
701  
702  
703  
704  
705  
706  
707  
708  
709  
710  
711  
712  
713  
714  
715  
716  
717  
718  
719  
720  
721  
722  
723  
724  
725  
726  
727  
728  
729  
730  
731  
732  
733  
734  
735  
736  
737  
738  
739  
740  
741  
742  
743  
744  
745  
746  
747  
748  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769  
770  
771  
772  
773  
774  
775  
776  
777  
778  
779  
780  
781  
782  
783  
784  
785  
786  
787  
788  
789  
790  
791  
792  
793  
794  
795  
796  
797  
798  
799  
800  
801  
802  
803  
804  
805  
806  
807  
808  
809  
810  
811  
812  
813  
814  
815  
816  
817  
818  
819  
820  
821  
822  
823  
824  
825  
826  
827  
828  
829  
830  
831  
832  
833  
834  
835  
836  
837  
838  
839  
840  
84

247

Mr. [redacted] reviewed the file and confirmed the bend payments regarding this Jordan estimate. In the other aspect of this file, Mr. [redacted] and Mr. [redacted] were contacted by Mr. [redacted] (Directorate of Information Operations and Reports, 1215 Jefferson) in the month of May, 1964, and requested to provide information regarding the Project (R/64-0188). Work was done on 05/31

93-18699

DTIC  
ELECTE  
AUG 13 1993

THE RELATION OF RECENT TAMPON USE, DOUCHING, COITUS,  
AND VAGINAL MEDICATIONS TO REPORTED CERVICAL  
CYTOLOGY RESULTS

By MARYANN KULPA, Major, United States Air Force

1993

59 pages

Master of Science in Nursing

University of Florida

DTIC QUALITY INSPECTED 3

Accession For	
NTIS GRA&I	<input checked="checked" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Avail and/or	
Dist	Special
A-1	

Abstract of Thesis Presented to the Graduate School  
of the University of Florida in Partial Fulfillment of the  
Requirements for the Degree of Master of Science in Nursing

THE RELATION OF RECENT TAMPON USE, DOUCHING, COITUS,  
AND VAGINAL MEDICATIONS TO REPORTED CERVICAL  
CYTOLOGY RESULTS

By

MARYANN KULPA

August 1993

Chairman: Sharleen Simpson  
Major Department: College of Nursing

Health care references recommend avoiding tampons, douching, coitus, and vaginal medications prior to cervical cytology screening yet little research supports these recommendations. A descriptive correlational design was used to investigate tampon use patterns among women of childbearing age and to determine the relationship of recent tampon use, douching, coitus, and vaginal medications to cervical cytology results.

One hundred and one women attending two north central Florida county health units were recruited. Women who use tampons exclusively had a higher incidence of abnormalities in their cervical cytology results than women who use pads exclusively. African-Americans were more likely to use

higher absorbancy and deodorant tampons, to douche, and they also had a higher incidence of gynecological infections. Of the health behaviors, coitus occurred most commonly prior to cytology screening. No significant relationship was found between recent tampon use, douching, coitus, and vaginal medication use and cervical cytology results.

THE RELATION OF RECENT TAMPON USE, DOUCHING, COITUS,  
AND VAGINAL MEDICATIONS TO REPORTED CERVICAL  
CYTOLOGY RESULTS

By

MARYANN KULPA

A THESIS PRESENTED TO THE GRADUATE SCHOOL  
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF SCIENCE IN NURSING

UNIVERSITY OF FLORIDA

1993

## ACKNOWLEDGMENTS

I would like to express my deepest appreciation to my committee, Sharleen Simpson, Sandra Seymour, and Hossein Yarandi, for their encouragement and guidance in the completion of this research. I extend heartfelt thanks to Dr. Jeff Rubin, Wanda Norman, Frankie Geiger, Laura Crossley, Marge Miller, and Becky Miller for inviting me into their clinics and directing subjects to me. Without the assistance of those listed above, this venture would not have been possible.

I would like to extend a special thank you to my mother, Eva, for her unflinching belief in me, and Betty and Terri, whose friendship maintained my sense of humor when it was needed most. And last, but certainly not least, I am thankful to my son Christopher for the love, joy, and sense of balance he brings to my life.

Educational funds were provided to the author by the United States Air Force Institute of Technology. The views and opinions stated in this work are those of the author and do not represent the opinions of the Department of Defense or the Department of the Air Force.

## TABLE OF CONTENTS

	<u>page</u>
ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES.....	v
ABSTRACT.....	vi
 CHAPTERS	
1 INTRODUCTION.....	1
Purpose Statement.....	3
Research Questions.....	3
Terminology.....	4
Assumptions.....	4
Limitations.....	5
2 REVIEW OF LITERATURE.....	6
Historical Perspective.....	6
Tampon Use.....	7
Tampons and Cervical Cytology.....	10
Vaginal Douching and Cervical Cytology.....	14
Coitus and Cervical Cytology.....	15
Vaginal Medications and Cervical Cytology.....	16
Summary.....	16
3 METHODOLOGY.....	18
Design.....	18
Setting.....	18
Sample.....	19
Instrumentation.....	19
Data Collection Procedures.....	20
Human Subjects.....	22
Procedure for Data Analysis.....	23
4 RESULTS.....	25
Sociodemographic Information.....	25
Tampon Use Patterns.....	28
Recent Health Behaviors.....	35

Health Behavior/Cytology Results.....	37
Additional Findings.....	39
Summary.....	41
5 DISCUSSION AND CONCLUSION.....	42
Discussion.....	42
Conclusion.....	47
APPENDICES	
A DEMOGRAPHIC AND DATA COLLECTION SHEET.....	50
B INFORMED CONSENT.....	54
REFERENCES.....	56
BIOGRAPHICAL SKETCH.....	59



# LIST OF TABLES

<u>Table</u>		<u>Page</u>
4-1	Summary Measures of Sociodemographic and Sexual History.....	26
4-2	Summary Measures of Demographic and Sexual History by Ethnicity.....	27
4-3	Summary Measures of Demographic and Sexual History by Cervical Cytology Results.....	28
4-4	Frequency and Percent of Menstrual Product Use.....	29
4-5	Frequency and Percent of Tampon Product Use.....	29
4-6	Frequency and Percent of Patterns of Tampon/Pad Use.....	31
4-7	Frequency and Percent of Menstrual Product Use by Ethnicity.....	32
4-8	Frequency and Percent of Tampon Product Use by Ethnicity.....	32
4-9	Frequency and Percent of Menstrual Product Use by Cervical Cytology Result..	33
4-10	Frequency and Percent of Tampon Product Use by Cervical Cytology Result.....	33
4-11	Frequency and Percent of Tampon Use Patterns of Women Grouped by Cervical Cytology Results.....	34
4-12	Health Behaviors Prior to Cervical Cytology.....	37
4-13	Subjects Report of Instructions Prior to Cervical Cytology Screening.....	40

Abstract of Thesis Presented to the Graduate School  
of the University of Florida in Partial Fulfillment of the  
Requirements for the Degree of Master of Science in Nursing

THE RELATION OF RECENT TAMPON USE, DOUCHING, COITUS,  
AND VAGINAL MEDICATIONS TO REPORTED CERVICAL  
CYTOLOGY RESULTS

By

MARYANN KULPA

August 1993

Chairman: Sharleen Simpson  
Major Department: College of Nursing

Health care references recommend avoiding tampons, douching, coitus, and vaginal medications prior to cervical cytology screening yet little research supports these recommendations. A descriptive correlational design was used to investigate tampon use patterns among women of childbearing age and to determine the relationship of recent tampon use, douching, coitus, and vaginal medications to cervical cytology results.

One hundred and one women attending two north central Florida county health units were recruited. Women who use tampons exclusively had a higher incidence of abnormalities in their cervical cytology results than women who use pads exclusively. African-Americans were more likely to use

Abstract of Thesis Presented to the Graduate School  
of the University of Florida in Partial Fulfillment of the  
Requirements for the Degree of Master of Science in Nursing

THE RELATION OF RECENT TAMPON USE, DOUCHING, COITUS,  
AND VAGINAL MEDICATIONS TO REPORTED CERVICAL  
CYTOLOGY RESULTS

By

MARYANN KULPA

August 1993

Chairman: Sharleen Simpson  
Major Department: College of Nursing

Health care references recommend avoiding tampons, douching, coitus, and vaginal medications prior to cervical cytology screening yet little research supports these recommendations. A descriptive correlational design was used to investigate tampon use patterns among women of childbearing age and to determine the relationship of recent tampon use, douching, coitus, and vaginal medications to cervical cytology results.

One hundred and one women attending two north central Florida county health units were recruited. Women who use tampons exclusively had a higher incidence of abnormalities in their cervical cytology results than women who use pads exclusively. African-Americans were more likely to use

higher absorbancy and deodorant tampons, to douche, and they also had a higher incidence of gynecological infections. Of the health behaviors, coitus occurred most commonly prior to cytology screening. No significant relationship was found between recent tampon use, douching, coitus, and vaginal medication use and cervical cytology results.

higher absorbancy and deodorant tampons, to douche, and they also had a higher incidence of gynecological infections. Of the health behaviors, coitus occurred most commonly prior to cytology screening. No significant relationship was found between recent tampon use, douching, coitus, and vaginal medication use and cervical cytology results.

## CHAPTER 1 INTRODUCTION

In the early 1980s toxic shock syndrome (TSS) was linked to the use of super absorbent tampons. Although the incidence of TSS has dropped dramatically, there are still 1-17:100,000 cases reported annually among menstruating women (Farley, 1991). Reporting of the disease by health care providers is voluntary. Strict guidelines require the reporting of only the severest of cases, resulting in possible under-reporting (Colbry, 1992). Women under age 30 who use tampons, particularly the 15- to 19-year age group, are at most risk. Very little research has been done in recent years to assess tampon use patterns of women or to determine if these patterns are consistent with the manufacturer's recommended instructions or those recommended by health care providers.

Tampons have also been associated with vaginal and cervical ulcers (Barrett, Bledsoe, Greer, & Droegemueller, 1977; Friedrich & Siegesmund, 1980; Jimerson & Becker, 1980; Weissberg & Dodson, 1983), vaginal laceration (Niv, Lessing, Hartuv, & Peyser, 1992), and anomalies of the vaginal epithelium (Friedrich, 1981; Raudrant, Frappart, De Haas,

Thoulon, & Charvet, 1989). Though tampons are thought to be safe and effective for menstrual hygiene purposes, the effect recent tampon use may have on the cervix has been minimally studied. If recent tampon use affects the cervix, then cervical cytology results could be changed by the use of this product.

Exfoliative cervical cytology as a method to screen for cervical cancer has been the foremost program for cervical cancer detection in the United States for over 40 years (Campion & Reid, 1990; Mandelblatt, 1989). Accurate specimen collection and evaluation are essential for any screening procedure. After evaluation by several investigators for its accuracy (Campion & Reid, 1990; Mandelblatt, 1989), cervical cytology remains the most effective, economical, and efficient method to screen for preinvasive cervical cancer. Positive results have been associated with increased anxiety either initially or at follow-up (Lauver & Rubin, 1990; Reelick, deHaes, & Schuurman, 1984) and increased costs for follow-up requiring either repeated specimens or colposcopy. Obviously, a false negative result is cause of greater concern but the cost, both monetarily and emotionally, of a false positive result cannot be ignored.

Several factors have been identified as affecting the quality of the cytology specimen including, presence of inflammation and red blood cells and timing within the menstrual cycle (Mandelblatt, 1989; Murphy, 1990). Health

care providers (Clay, 1990; Kern, 1968; Mandelblatt, 1989; Murphy, 1990) have suggested that patients be instructed to avoid coitus, tampons, douching, or medications in the vagina from 24 hours to 48 hours to several days prior to screening for cervical cytology. Very little research is available to support the health behavior restrictions outlined above, suggesting the need for further research.

#### Purpose Statement

The purpose of this pilot study was to investigate tampon use patterns among women of childbearing age and determine the relation of recent tampon use, douching, coitus, and vaginal medications to cervical cytology results.

#### Research Questions

The research questions were as follows:

1. What are the tampon use patterns among women of childbearing age in north central Florida?
2. What are the patterns of health behavior exhibited by these women in regards to tampon use, douching, coitus, or medications in the vagina in the one to four day period prior to cervical cytology specimen collection?
3. Do women who engage in these health related behaviors within 48 hours of cytology specimen collection have a higher incidence of abnormalities in their reported cytology results?



### Terminology

For the purposes of this research, the following definitions were used:

Tampon use is the use of any fiber rolled device in the vagina at any time for the purpose of collecting uterine or vaginal discharge.

Cervical cytology smear is the collection of endocervical and exocervical cells from the human female cervix used to identify both precancerous and cancerous cells.

Abnormalities in cytology results are the reporting of any inflammation, squamous metaplasia, atypia, or cervical intraepithelial neoplasia (CIN) on the pathology report.

### Assumptions

Tampon use is drying to the vaginal epithelium and has been associated with vaginal and cervical ulcers along with cellular anomalies of the vaginal epithelium. Toxic shock syndrome has been associated with the use of high absorbency tampons.

Accurate cervical cytology specimen collection is essential to optimal cervical cancer screening (Kern, 1968). Patient preparation is an important part of obtaining an accurate specimen for any screening test. Any behavior or condition that could affect the cells on the surface of the

cervix could alter the cells significantly enough to produce an other than normal cytodiagnostic exam.

#### Limitations

The population was self-selected from two low income family planning clinics and may not represent the general population, limiting the study's generalizability. The small size of the sample also limits the generalizability of the findings.

## CHAPTER 2 LITERATURE REVIEW

### Historical Perspective

The use of tampons for contraception has occurred since before Christ. Himes (1963, p. 64) describes a medicated lint tampon used by the ancient Egyptians to prevent conception in as early as 1550 B.C. The use of tampons for medical purposes was first reported in 1776 when a French physician used tightly wound linen cloth dipped in vinegar to control hemorrhage and treat leukorrhea. In the 1800's, other European physicians used tampons to control nonmenstrual vaginal discharge and for the application of antiseptics.

During the 1800's, theatrical performers and professional models were known to use tampons for menstruation (Thornton, 1943). Disposable perineal napkins made their debut on the market near the end of World War I as the first commercial product available for feminine hygiene (Wheatley, Menkin, Bardes, & Rock, 1965). A Colorado physician, E. C. Haas patented a vaginal tampon in 1933 consisting of surgical cotton with a cardboard applicator (Thornton, 1943). In 1936, Tampax Incorporated bought the

patent and through a national advertising campaign popularized the use of tampons during menstruation.

Papanicolaou (1941), for whom the pap smear was named, initially used vaginal smears to assist in the diagnosis of uterine cancer. The original procedure was to use a glass pipette inserted into the woman's vagina and withdraw secretions from the posterior fornix using a rubber bulb (Papanicolaou & Traut, 1941). In 1947, Ayre, a Canadian gynecologist, described a procedure for using a speculum and scraping cells from the cervix with a wooden spatula (Ayre, 1947). This method allowed pathologists to study cells before the cells became shrunken or degenerated. Ayre proposed this method to identify precancerous cells and changed the focus from diagnosing existing cancer to prevention of cervical cancer deaths by early detection.

#### Tampon Use

In response to patients' concerns, initial studies related to tampons focused on safety after their commercial introduction for menstrual use. Medical literature centered on moral debates, clinical issues, and efficacy of the tampon (Osterholm et al., 1982). In some studies, women who were previously not tampon users were asked to use them as part of the study. Very little related to existing tampon usage was available. Close to 30 years after the introduction of tampons in the commercial market, Wheatley, Menkin, Bardes,

and Rock (1965) studied 903 private practice patients for menstrual product use and occurrence of pathological findings. Almost 50% (49.5%) wore pads only and on the average tended to be six years older than the patients who wore only tampons (32.3%). The "tampon only" population had worn tampons for a range of 4 months to 24 years. Racial or ethnic distinction was not addressed. Pathological findings from this study will be discussed in the section about tampons and cervical cytology.

In 1980, when toxic shock syndrome (TSS) was linked to tampon use, researchers focused on tampon use patterns to gain a greater understanding of the disease and study the effect media coverage was having on young women's use of menstrual hygiene products. Brooks-Gunn and Ruble (1982) studied 619 (primarily white-95%, Catholic-40%) adolescent females aged 10-19 regarding menstrual product use and the relation of tampon use to menstrual symptoms, attitudes, and family beliefs about menstruation. Napkin use was highest in 5th to 6th graders while tampon use increased as the females moved from elementary to senior high school. The majority of adolescents learned how to use tampons from their mothers and a positive family atmosphere was reported by females who learned how to use tampons from their mother rather than from others.

Media attention to the toxic shock association with tampon use resulted in some initial changes in tampon usage

in one population of adolescents. Seven hundred and fourteen adolescents were surveyed to examine patterns of tampon use before and after media coverage of TSS (Irwin & Millstein, 1982). Of the 714 adolescents surveyed, 33.9% reported changing their tampon habits, 27.5% reportedly stopped using tampons, and 6% decreased use of tampons. Seventy-five percent of the females who reported decreasing or stopping use of tampons identified TSS as a factor influencing their decision. The two factors that significantly contributed to a change in tampon use were 1) the use of Rely™ tampons before TSS publicity, and 2) a belief by the individual, herself, that she was especially susceptible.

Finkelstein and von Eye (1990) conducted an investigation of tampon use patterns among different racial-ethnic groups that included 699 white, 477 black, and 425 Mexican American woman. Since TSS had been reported predominantly in young white females, they hypothesized that age and racial-ethnic differences in product use would explain the differences in incidence of TSS. Because 43% of the 477 black women who participated in the study did use tampons, the researchers concluded that racial-ethnic variations alone were not accountable for low TSS rates among blacks. Whites were more apt to use tampons than blacks and Hispanics were least likely to use tampons. All racial-ethnic groups reported decreased use of tampons since media

coverage of TSS. Fear of TSS was the most common reason for not using tampons.

### Tampons and Cervical Cytology

Although the effects of recent tampon use, i.e., within 48 hours, have not specifically been studied, there has been some research on the effect of tampons on cervical cytology. The impact tampons have on the vaginal mucosa has been studied much more closely and biopsies have been taken from tampon induced vaginal and cervical ulcerations. The results of these studies will be reviewed.

The effect of tampons on the vaginal mucosa was of most concern to early researchers in response to patient questions regarding the safety of tampons. Sackren (1939) studied the use of vaginal tampons during menstruation for a three-to-five month period on a small sample of 21 women. A gynecological exam was conducted prior to and at the end of each menstrual cycle. The specifics of what was included in the gynecological exam were not addressed. Sackren reported "no observable changes in the vaginal or cervical tissues" (p. 328). As the cervical scraping method of evaluating cervical cellular irregularities and colposcopy were yet to be discovered, cellular cervical changes could not be evaluated at the time of this study.

Thornton (1943), aided by a grant from the International Cellucotton Company, studied tampon use in a larger sample of

110 women. Subjects received an initial exam during which they were instructed in tampon use. Every two months subjects were to report to the investigator for an exam and interview. Cervical erosion was present on initial exam on 51 of the subjects. At the end of the study, 14 of those 51 had no cervical erosion and 17 showed less erosion than during the initial exam. Twenty subjects remained unchanged. The researcher concluded that "There was no evidence of any irritation of the cervix or vagina by the tampon" (p. 264). The time frame of the exam in relation to recent tampon use was not addressed and cervical cytology results are not reported.

Wheatley, Menkin, Bardes, and Rock (1965) studied the relation of tampons with a variety of gynecological pathologies in 903 women. Participants received a gynecological exam, cervical cytology smear, and Schiller test and the results were then correlated by menstrual product use with a variety of pathological findings including erosion and eversion of the cervix, cervical polyps, cervical laceration, vaginitis, etc. No difference was found between tampon and pad users for all pathologies evaluated except erosion and eversion of the cervix. Tampon-only users appeared to have a reduced, but not significant, incidence. The time elapsed from last tampon use to time of examination is not addressed.



Kovar, Giblin, and Roddy (1959) studied whether tampons rest directly on the cervix by taking xrays of women with tampons in place. Thirty-three women wore tampons for 3 to 12 hours and then had xrays taken in the standing position. Surgical clips had been placed on the cervix and the tampons were treated with a radiopaque surgical thread. The tampon was directly near the cervix on only 1 of the 33 women and was located in the lateral fornices on the remainder.

In the late 1970's and early 1980's tampons were associated with vaginal and cervical ulcers in several case studies. Jimerson and Becker (1980) identified 10 cases of vaginal ulcers, 9 at the anterior vaginal fornix, which all resolved with cessation of tampon use. All patients had changed tampons frequently with no lost or misplaced tampons. The period of continuous use of tampons ranged from 19 days to 6 months. Acute and chronic inflammation and ulceration were noted on biopsies from the ulcerated area.

Weissberg and Dodson (1983) identified three cases of recurrent vaginal and cervical ulcers, and this was the only case study in which cervical cytology results are reported. The cytology results on a 16-year-old nulliparous female with a 1 X 1 cm cervical ulcer were reported as normal. The biopsy results in a 47-year-old with a 2 X 5 cm cervical ulcer showed acute inflammation. All three women in the cases presented developed vaginal ulcers again when use of tampons was resumed after initial ulcers had healed.

The effects of tampons on the vaginal mucosa in a study of 80 women was well reviewed by Friedrich and Siegesmund (1980). Cellular changes and microulcerations had been noted. As would be expected, women who used more absorbent tampons had a higher incidence of drying, layering, or microulceration. Structural and cellular anomalies are now more easily demonstrated with the use of colposcopy, scanning electron microscopy, and transmission electron microscopy (Raudrant, Frappart, De Haas, Thoulon, & Charvet, 1989). Subjects wore tampons for four hours after which colposcopies with biopsy were performed. Cellular changes that were apparent after the four hour period were consistent with previous studies by Friedrich (1981).

Researchers with the Tri-State Toxic-Shock Syndrome Study studied 80 women who had toxic shock syndrome to determine other factors that may have played a role. In this study, the use of hygiene products, sexual practices, and other personal health history practices were not significant in the development of toxic shock syndrome (TSS). Tampon absorbency, on the other hand, was significantly associated with developing the syndrome (Osterholm et al., 1982). Epidemiological studies, both state and federal, along with Food and Drug Administration involvement resulted in the removal of Rely™ tampons from the shelves and initiating tampon box labeling regarding the association with TSS.

### Vaginal Douching and Cervical Cytology

Douching originated in Biblical times and has been practiced by many women since that time. In recent years the practice has been a hotly debated subject because of questions about safety and use patterns among American women. The purpose for douching has been a source of controversy for some time. Evaluation of the association between douching and pelvic inflammatory disease, cervical cancer and ectopic pregnancy has revealed generally inconsistent findings. For the purpose of this study, only the research related to douching and cervical abnormalities will be reviewed.

In a study of 266 patients with cervical cancer, researchers associated frequent douching (more than once per week) with an increased incidence of cervical cancer (Gardner, Schuman, Slattey, Sanborn, Abbott, & Overall, 1991). Multiple logistic regression was used to control confounding variables such as age, smoking, number of partners, and educational level. The authors hypothesized that the vaginal chemical environment was altered with frequent douching. Gentry (1990) found a statistically significant relationship between women who douched frequently and the incidence of abnormal pap smears in a population similar to the population being considered in this study.

In contrast, Brinton et al. (1987) did not find a significant increased risk of squamous cell cervical cancer

with douching. An increased risk, though not statistically significant, was associated with women who douched five or more times per month.

Patracca's study (cited by Kern, 1965) was the basis for recommending patients not douche prior to cytology smear collection. Unfortunately, an English translation could not be found for review. Douching prior to cytology specimen collection is suspected of washing secretions out of the vagina making adequate material difficult to collect (Kern, 1965; Murphy, 1990).

#### Coitus and Cervical Cytology

The link between sexual activity and abnormalities of the female cervix, both dysplasia and cervical cancer, is well documented. Number of sexual partners and early age of intercourse have been implicated (Clarke, Hatcher, McKeown-Eyssen, & Lickrish, 1985; Fujimoto, Nemoto, Fukuda, Masubuchi, & Masubuchi, 1985). Human papilloma virus (HPV) has been implicated in several studies as increasing the risk of cervical dysplasia. Studies related to the effect of recent sexual intercourse on cervical cytology results were not found.

Singer (1975) studied cervixes of virginal and sexually active young women and found that the sexually active women had smaller transformation zones. It was hypothesized that trauma or uterine muscle contractions were responsible for

shrinking this area. The length of time between sexual activity and assessment of the cervix is not addressed. The sexually active women were female prisoners who would most likely not have been sexually active at the time of the study.

#### Vaginal Medications and Cervical Cytology

No specific testing of the effect of vaginal medications on cervical cytology screening was found. Kern (1968) recommends that "no medications (particularly contraceptives) should be inserted vaginally." (p. 49) for patients undergoing cervical cytology smear collection. Intravaginal products are thought to contaminate cervical secretions (Murphy, 1990).

#### Summary

Research about tampon use has been sporadic primarily precipitated by its association with TSS. Very few researchers have addressed tampon use patterns since the early 1980's yet TSS continues to affect young women who use tampons. Knowledge of use patterns might help health care workers focus educational efforts.

Pathology reports of tampon users reflect cellular changes, though, in only a few cases, is reference made specifically to cervical cytology smear results. Health care providers recommend limiting the use of tampons, douching,

sexual intercourse, and vaginal medications in the 24-48 hours period prior to cytology smear collection. The effects of any of these health behaviors on cervical cytology results, with the exception of possibly douching, have not specifically been evaluated.

Questions regarding menstrual hygiene product use remain unanswered in addition to questions regarding health behaviors prior to cervical cytology smear collection. Who uses tampons and for how long? Do women who use tampons have more abnormalities reported in their cervical cytology results. Are cervical cytology results affected by recent tampon use, douching, coitus, or the use of vaginal medications? Answers to these questions may provide insight into needed education for women of childbearing age regarding menstrual hygiene and cytology exam preparation.

### CHAPTER 3 METHODOLOGY

This chapter contains the study design, setting, sample, and procedures for data collection and analysis.

#### Design

The research design of this study was descriptive correlational. The purpose of this research was to investigate tampon use patterns among women of childbearing age and determine the relation of recent tampon use, douching, coitus, and vaginal medications to cervical cytology results. Women attending family planning clinics in two north central Florida county health departments participated in the study.

#### Setting

The research sites selected were family planning clinics in two north central Florida Public Health Units. Health departments provide primary health care to low income men, women, and children residing within the respective county. A rural county health unit that serves approximately 8-10 family planning clients daily and a semi-rural health unit that serves approximately 25-30 family planning clients daily

were used as research sites. Subjects were recruited at the time of their clinic appointments. Data collection occurred during the months of April and May, 1993.

### Sample

The convenience sample consisted of 102 sexually active women between the age of 18 and 42 who presented to the family planning clinic for an annual physical examination including a gynecological exam. Women who were pregnant or attending the clinic for initial postpartum visits were excluded as that population would not be performing those health behaviors under investigation. Non-English speaking clients were also excluded. Informed consent was obtained by the principal researcher in all but two cases prior to participation in this study. The nurse practitioner at the rural unit obtained consent from the other two participants. Subjects who did not want to finish completing the questionnaire did not return the questionnaire to the principal investigator. No coercion was given to complete the questionnaire. One subject did not complete the questionnaire and was excluded.

### Instrumentation

A data collection form developed by the principal investigator was used to record data from each subject and her medical record (see Appendix A). Subjects completed the



first pages regarding demographic data, tampon use, and recent health behaviors prior to gynecological exam. Chart review provided information about previous gynecological history.

#### Data Collection Procedures

Because this research involved a questionnaire and chart review only, it was exempt from review by the Health Science Center Institutional Review Board. The appropriate forms were filed. Research proposals were submitted to the two counties expressing interest in the study. Permission was obtained by the directors of each unit. Florida Department of Health and Human Services district level approval was sought and obtained. Copies of approval letters and the prospectus were evaluated at the Florida Department of Health and Human Services where approval by expedited Institutional Review Board was granted.

The rural county questionnaires were numbered consecutively with four digits with the first number always designated as a one. Prospective subjects were screened after clerical assistants finished preparing the chart for the exam. Either the principal investigator or the nurse practitioner screened the client for eligibility, i.e. age 18-42, female, non-pregnant, sexually active, and presenting for cervical cytology testing and then were asked to participate. The informed consent (Appendix B) was verbally reviewed with

the client with a full explanation of the study's purpose and procedure prior to obtaining a signature. Permission was obtained to review the subject's medical chart. Subjects were informed that participation was voluntary and that withdrawal at any time would not affect their care. A questionnaire was then given to the subject to complete. Subjects were encouraged to ask questions and seek out the principal investigator if questions were not understood.

During the last two weeks of data collection the nurse practitioner offered to obtain subjects for the study. An instruction sheet was prepared by the investigator outlining who could participate along with procedures to follow for obtaining informed consent and administering the questionnaire.

The semi-rural county questionnaires were numbered consecutively with four digits with the first number always designated as a two. Prospective subjects were screened by clerical assistants for eligibility as noted above and directed to the principal investigator. Again, the informed consent was verbally reviewed with the client along with a full explanation of the study's purpose and procedure prior to obtaining a signature. Permission was obtained to review her medical chart. Subjects were informed that participation was voluntary and that withdrawal at any time would not affect their care. A questionnaire was then given to the subject to complete and return to the principal investigator.

Subjects were encouraged to ask questions or approach the principal investigator if questions were not understood.

Charts at both clinics were reviewed for gynecological history after clients had finished with their examination. A log was maintained by the principal investigator indicating the questionnaire number, date, subject's name, and an area to depict completion of the questionnaire after cytology results returned to the clinic. The specimens obtained at both sites were sent to the same lab for analysis. As lab and cytology results arrived at each clinic, questionnaires were matched to record the laboratory results from the appropriate chart.

#### Human Subjects

Informed consent included a verbal and written explanation of the purpose of the study, the risks, and the benefits. All subjects were assured their care would not be different if they declined to participate in the study. Data collection occurred in an office area separate from the client waiting area at the rural clinic. At the semi-rural clinic, data collection occurred in the waiting room with subjects completing the questionnaire while waiting to have their exam.

Every attempt was made to protect the privacy and confidentiality of the subject's answers to questions. One client required interview because of visual difficulties and

a quiet area was used for the interview. The log book employed to match questionnaires with laboratory results was kept secure from clinic personnel and other patients. Numbers on the data collection forms were coded for use with the log only. The rights and well-being of all subjects participating in this study have been protected. Before and after completing the questionnaire, subjects were thanked for their participation in the study.

#### Procedure for Data Analysis

Sociodemographic data for the entire sample were analyzed using descriptive statistics, frequencies, and/or means and included age, ethnicity, education, number of pregnancies, age at first pregnancy, and sexual history. Descriptive statistics continued to be employed to describe tampon use patterns of the group along with health behaviors practiced prior to cervical cytology smear collection. The data were then grouped by reported cervical cytology results with those with negative cervical cytology results in one group and those with cervical cytology abnormalities in another. Descriptive statistics were employed to analyze socio-demographic variables, tampon use patterns, and recent cervical cytology health behavior data. The data were further grouped to explore ethnicity differences in the aforementioned areas.

Chi square ( $\chi^2$ ) and Fisher's Exact Test were used to determine the relationships of recent tampon use, douching, coitus, and vaginal medications to reported cytology results. Reported cytology results were grouped as negative or other than negative. Recent tampon use, douching, coitus, and vaginal medications were grouped according to time of occurrence. The first group consisted of those who performed the particular health behavior within 48 hours of the exam. The second group consisted of subjects who had performed the particular activity later than 48 hours prior to the exam. Those subjects who reported the activity occurring three, four, or greater than four days ago were included. The third group consisted of subjects who did not participate in the particular activity, i.e., those who reported non use of tampons, douche, etc. Results of this data analysis will be reported in Chapter 4.

## CHAPTER 4 RESULTS

The purpose of this research was to investigate tampon use patterns among women of childbearing age and determine the relation of recent tampon use, douching, coitus, and vaginal medications to cervical cytology results in women of childbearing age. The specific aims of this study were to: (1) describe the tampon use patterns among women of childbearing age, (2) describe the patterns of health behavior exhibited by these women in the one to four day period prior to cervical cytology screening, and (3) determine whether women who engage in these particular health related behaviors within 48 hours of cytology specimen collection would have a higher incidence of abnormalities in their reported cytology results. This chapter presents the data analysis in five sections: sociodemographic information, tampon use patterns, recent health behaviors, health behavior/cytology results, and additional findings.

### Sociodemographic Information

The sample consisted of 101 women attending Public Health Unit family planning clinics in two north central Florida counties. Nineteen participants were from a rural

county and 82 were from a semi-rural county. Of the 101, there were 23 African-Americans (22.8%), 77 Caucasians (76.2%), and 1 Hispanic (1%). The mean age was 24.5 years with a range of 18-40 years. Mean educational level was 11.6 years with a range of 2-16 years. Over 92% had three or less pregnancies with the mean age of first pregnancy at 19.06 years. The youngest reported age of first pregnancy was 14 years and the oldest reported age was 33 years.

Sexual history for each participant was recorded in Questions 20-22 (Appendix A). Seventy-three (72.3%) reported having one sexual partner during the past year while the maximum number of partners recorded by any of the participants during the past year was four. Of the 95 who responded to the question regarding lifetime number of partners, the mean was 5 partners. Sixty-nine (66%) reported between two to five partners. Table 4-1 depicts summary

Table 4-1. Summary Measures of Demographic and Sexual History (N=101)

Variable	Mean	SD	Range
Age	24.5	5.4	18 - 40
Education (years)	11.6	2.0	2 - 16
Age at First Pregnancy	19.1	4.0	14 - 33
Age at First Intercourse	16.3	3.2	10 - 33
Lifetime Number of Partners <sup>a</sup>	5.3	7.4	1 - 70

<sup>a</sup>Bimodal 3 and 4, 22 subjects each

measures of selected sociodemography and sexual history regarding the entire sample. The mean for number of partners was skewed as a result of one woman reporting 70 partners. Modes and medians are represented in most cases.

Demographic and sexual history data based on ethnic grouping revealed very little difference between the African-American and Caucasian groups with the exception of lifetime number of partners. Mean number of lifetime partners for Caucasians was 5.7, whereas, mean number of lifetime partners for African Americans was 3.8. Age, education, age at first pregnancy, and age of first intercourse were similar as depicted in Table 4-2.

Table 4-2. Summary Measures of Demographic and Sexual History by Ethnicity (N=100)

Variable	African-American n = 23		Caucasian n = 77	
	Mean	SD	Mean	SD
Age	23.9	5.6	24.8	5.4
Education (Years)	11.7	1.7	11.5	2.1
Age at First Pregnancy	18.5	4.2	19.2	4.0
Age at First Intercourse	16.4	4.2	16.3	2.9
Lifetime Number of Partners	3.8	1.9	5.7	8.3

The one Hispanic subject who participated in the study was 19 years of age with a 13 year education. The subject



had not been pregnant, first had intercourse at age 16 and reported a lifetime number of partners of 4.

Results of demographic and sexual history data for groups based on cervical cytology results are shown in Table 4-3. Those with abnormalities were approximately one year older and had first intercourse at an older age. Mean number of lifetime partners was higher for the negative result group. Median number of lifetime partners for both sample groupings was four. Mode for the negative cytology group for lifetime partners was three while the mode for the cytology group with abnormalities was four.

Table 4-3. Summary Measures of Demographic and Sexual History by Cervical Cytology Results (N=101)

Variable	Negative n = 63		Abnormalities n = 38	
	Mean	SD	Mean	SD
Age	24.2	5.4	25.0	5.5
Education (Years)	11.7	1.6	11.4	2.5
Age at First Pregnancy	19.1	4.3	19.0	3.6
Age at First Intercourse	15.9	2.6	17.0	3.9
Lifetime Number of Partners	5.8	9.1	4.39	3.1

#### Tampon Use Patterns

##### Research Question No. 1

What are the tampon use patterns among women of childbearing age in north central Florida? Women were asked

what types of feminine hygiene products they used to absorb menstrual flow. Table 4-4 outlines menstrual product use of the entire sample. Almost 65% of the women reportedly used tampons either alone or with pads during menstruation. One woman reported using toilet tissue because of chafing and allergies to pads and reported being advised by a physician to not use tampons because of "infections".

Table 4-4. Frequency and Percent of Menstrual Product Use (N=101)

Menstrual Product	f	%
Tampons	36	35.6
Tampons and Pads	29	28.7
Pads	35	34.7
Other	1	1.0

Table 4-5. Frequency and Percent of Tampon Product Use (n=66)

Tampon	f	%
Regular	28	42.4
Super	28	42.4
Super Plus	6	9.1
Regular + Super	4	6.1
Deodorant	26	39.4

Note: Tampon users may have selected deodorant tampon use so frequencies will not total (n).

Among tampons users, regular and super were the most often used products with less than 10% using the most

absorbant super plus. Table 4-5 lists subjects' choice of tampon products. The majority of subjects who were tampon users (60.6%) did not use deodorant tampons.

In response to a question regarding how long women usually left a tampon in, tampon users reported an average of 2.9 hours with a range of 1-6 hours. When asked what the longest amount of time tampons had been left in the vagina, women reported an average of 3.9 hours with a range of 1-8 hours. Three responses to the question regarding the longest amount of time tampons were left in the vagina were not able to be coded because a specific number of hours was not recorded. Two subjects responded with "overnight" or "all night" and one responded with "all day". All tampon users denied using tampons at times other than the menstrual period.

Patterns of tampon use varied, with tampons exclusively being used for menstruation by over 50% of women. Table 4-6 illustrates the frequency and percent of responses to a question regarding tampon and pad patterns of use. Eight subjects were coded as "other". Four subjects selected two of the available choices, three wrote in that they use tampons while engaging in outdoor activities such as swimming or picnicking, and one used pads during the day and tampons at night.

In the groups divided by ethnicity, Caucasians were more likely to use tampons for menstrual hygiene needs than African-Americans. Of those reporting tampon use, Caucasians were more likely to use regular tampons and African-Americans

Table 4-6. Frequency and Percent of Patterns of Tampon/Pad Use (n=67)

Variable	f	%
Tampons Only During Period	35	52.2
Tampons Heavy Days/Pads Light	7	10.4
Tampons During Day/Pads Night	14	20.9
Tampons and Pads Together	3	4.5
Other	8	11.9

were more likely to use higher absorbency super tampons. Four subjects reported using a combination of regular and super tampons. See Tables 4-7 and 4-8 for menstrual and tampon product use by ethnicity. The Hispanic subject reported using pads as a menstrual product therefore, Hispanics were not represented in the tampon use analysis. African-Americans were more likely to use deodorant tampons (54.5%) in this population than Caucasians (36.4%).

The length of time that subjects wore tampons was similar for both ethnic groups reporting tampon use. One to six hours was the range for both groups. African-Americans wore tampons an average of 2.7 hours and Caucasians wore tampons an average of 2.9 hours. Means for longest amount of

time subjects kept a tampon in the vagina were 3.1 hours for African-Americans and 4.1 for Caucasians.

Table 4-7. Frequency and Percent of Menstrual Product Use by Ethnicity (N=101)

Menstrual Product	African-American n = 23		Caucasian n = 77		Hispanic n = 1	
	f	%	f	%	f	%
Tampons	5	21.7	31	40.3	0	0
Tampons and Pads	6	26.1	23	29.9	0	0
Pads	11	47.8	23	29.9	1	100
Other	1	4.3				

Table 4-8. Frequency and Percent of Tampon Product Use by Ethnicity (N=100)

Tampon	African-American n = 11		Caucasian n = 55	
	f	%	f	%
Regular	2	18.2	26	47.3
Super	7	63.6	21	38.2
Super Plus	2	18.2	4	7.3
Regular + Super	0	00.0	7	7.3
Deodorant	6	54.5	20	36.4

Note: Frequencies may not add up to (n), subjects could select deodorant in addition to other variables.

The breakdown of subjects grouped by cervical cytology results and menstrual product use is shown in Table 4-9. Those who use tampons exclusively had a higher incidence of

abnormal results than those who use pads exclusively  $\chi^2(1, n = 71) = 3.41, p = .0647$ . However, when the tampon users that also use pads were included, the chi square indicated less significance  $\chi^2(1, N = 101) = 1.19, p = .2752$  for tampon use itself. Choice of absorbency by the subjects showed less difference between the groups. The breakdown of type of tampon used and cytology results is shown in Table 4-10.

Table 4-9. Frequency and Percent of Menstrual Product Use by Cervical Cytology Result (N=101)

Menstual Product	Negative n = 38		Abnormalities n = 63	
	f	%	f	%
Tampons	18	28.6	18	47.4
Tampons and Pads	20	31.7	9	23.7
Pads	25	39.7	10	26.3
Other			1	2.6

Table 4-10. Frequency and Percent of Tampon Product Use by Cervical Cytology Result (n=66)

Tampon	Negative		Abnormalities	
Regular	16	41.0	12	44.4
Super	18	46.2	11	37.0
Super Plus	3	7.7	3	7.4
Combination	2	5.1	2	7.4
Deodorant	15	38.5	11	40.7

Those with negative results reported leaving tampons in place for longer periods of time. The negative result group reported a mean of 3.0 hours for a question related to length of time tampons were "usually left in", whereas, those with abnormalities reported a mean of 2.6 hours. In response to the longest amount of time a tampon was left in the vagina, those with negative results reported a mean of 4.4 hours while those with abnormalities reported a mean of 3.3 hours.

Though not statistically significant, women who use tampons exclusively during their menstrual cycle were more likely to have abnormalities reported on cervical cytology results than women who combine tampons with pad use. The "tampons and pads" selection was included in the combination group but clarification of actual tampon and pad use was not

Table 4-11. Frequency and Percent of Tampon Use Patterns of Women Grouped by Cervical Cytology Results (n=67)

Tampon Pattern	Negative n=40		Abnormalities n=27	
	f	%	f	%
Tampons Only	18	45.0	17	63.0
Tampons Heavy/ Pads Light	7	17.5	0	00.0
Tampons Day/ Pads Night	9	22.5	5	18.5
Tampons and Pads	2	5.0	1	3.7
Other	4	10.0	4	14.8

provided. Subjects may have used tampons and pads combined for the entire menstrual cycle. Table 4-11 outlines tampon use patterns grouped by cervical cytology results.

### Recent Health Behaviors

#### Research Question No. 2

What are the patterns of health behavior exhibited by these women in regards to tampon use, douching, coitus, or medications in the vagina in the one to four day period prior to cervical cytology specimen collection. This analysis includes descriptions of subjects' tampon use, douching, coitus, and vaginal medications within the four day period prior to their clinic appointment.

Since tampon use is dependent on the menstrual cycle, the likelihood of women using tampons just prior to their gynecological appointment is considerably lessened. Within the 24 hours prior to exam 9 (8.9%) of the total sample, or 13.6% of the 7 subjects who reported using tampons, used vaginal tampons. Within 48 hours of exam, 12 of the total sample used vaginal tampons or 18.2% of the tampon users. Within the 4 days prior to exam, 18 subjects, or 27.3% of the tampon users, had used vaginal tampons.

Douching prior to exam was performed by very few. The results may have been affected by instructions given to subjects at the semi-rural clinic where patients are instructed not to douche for 72 hours prior to their clinic



appointment. In the 24 hours prior to exam period, 3 subjects reported douching. In the 48 period prior to exam, a total of 7 subjects reported douching. In the four days prior to cervical cytology exam, 14 subjects douched.

Coitus occurred more frequently than the rest of the health behaviors explored in this study. Twenty-two subjects reported intercourse in the 24 hours prior to exam. In the 48 hours prior to exam, 36 subjects reported coitus had occurred. Over 50% (52%) reported coitus in the four days prior to exam.

The use of vaginal medications prior to exam was reported by very few subjects. Only two subjects reported the use of vaginal medications within 24 hours prior to their exam. The two medications specified were an antifungal and a contraceptive. No additional subjects reported using vaginal medications within the two day period. A total of four women used vaginal medications within four days prior to exam. In addition to the medications identified above, subjects cited an antifungal and a lubricant. Of the 36 woman who recorded vaginal medication use over four days prior to their exam, 21 cited antifungal agents. One woman reported an "antibiotic" with no additional information. Table 4-12 outlines each of the health behaviors and frequency of occurrence within the sample.

Table 4-12. Health Behaviors Prior to Cervical Cytology  
(N=101)

Variable	Tampon Use	Douching	Coitus	Vaginal Meds
< 24 hours	9	3	22	2
2 days ago	3	4	14	0
3 days ago	3	2	12	1
4 days ago	3	5	4	1
> 4 days	52	56	41	36
no use	31	29	7	59

#### Health Behavior/Cytology Results

##### Research Question No. 3

Do women who engage in these health related behaviors within 48 hours of cytology specimen collection have a higher incidence of abnormalities in their reported cytology results? The responses on the questionnaire related to this issue were divided into groups based on when subjects last reported these health behaviors as mentioned previously.

The use of tampons within 48 hours of cervical cytology specimen collection was not significant (Fisher's Exact Test,  $p = 0.401$ ). Of the 12 subjects who used tampons within the 48 hours prior to cytology collection, only three contained abnormalities.

Douching was a common practice in this population. Sixty-eight (67.3%) of the subjects answered yes to the

question "Do you douche?". This was a lower percentage than a previous study with a similar population (Gentry, 1991). African-American women were more likely to douche than Caucasian with with 18 out of 23 (78.3%) as opposed to 50 out of 77 (64.9%).

The relationship between douching practices and current cervical cytology results was not significant at  $\chi^2(1, N = 101) = 1.12, p = .2901$ . The percentage of the women with abnormal cytology results who douched (73.7%) was higher than the percentage of women with negative cervical cytology results (63.5%). Gentry (1991) found a statistically significant relationship between women who douche and a history of abnormal results. This did not occur with this population and current cytology smears.

The relationship between douching within 48 hours of cervical cytology specimen collection and cervical cytology results was not significant (Fisher's Exact Test,  $p = 0.191$ ). Nine subjects douched within 48 hours of exam and eight results were reported without abnormalities.

Coitus prior to cervical cytology occurred more frequently than the other health behaviors investigated. Thirty-six subjects reported sexual intercourse within the 48 hour period prior to cytology exam. Thirteen had cervical cytological abnormalities. Using the Fisher's Exact Test ( $p$

= 0.199) no significance was found between recent coitus and cervical cytology results.

Vaginal medications were used by very few women in the 48 hour period prior to cervical cytology exam. Fisher's Exact Test,  $p = 0.299$  was not significant indicating no association between vaginal medications and cervical cytology results.

#### Additional Findings

Smoking has been associated with an increased risk of cervical cancer. Smoking was not associated with abnormalities in cervical cytology smears in this study,  $\chi^2(1, N = 101) = .25, p = .1488$ . Of the 38 cytology specimens with abnormalities, 17 were smokers and 21 were not smokers. Of the total sample, 42 (41.6%) smoke with 81% smoking a pack per day or less. Mean number of years subjects smoked was 8.48.

Subjects were asked what instructions they had received prior to their cytological exam. The semi-rural health unit, as stated earlier, informs prospective patients not to douche for 72 hours prior to their appointment. Clerks, who schedule appointments, provide verbal instructions when appointments are made by phone and provide both written and verbal instructions when appointments are made at the clinic. The rural health unit does not instruct patients in

any restrictions of health behaviors prior to their appointment.

Of the 101 subjects, 55 (54.5%) reported receiving no instructions. Table 4-13 provides a breakdown of the remainder of the responses. Of the "other" responses, avoiding douching for a variety of time frames was written in by 23 of the subjects. This might explain the low number of subjects who douched prior to their appointments.

Table 4-13. Subjects Report of Instructions Prior to Cervical Cytology Screening.

Variable	f	%
No Instructions	55	54.5
No Douching/Sex X 24 Hours	13	12.9
No Douching/Tampons/Sex X 24 Hours	1	1.0
No Douching/Tampons/Sex X 48 Hours	4	4.0
Other	28	27.7

African-American women had a slightly higher incidence of abnormalities in current cervical cytology smears  $\chi^2(1, N = 100) = 1.22, p = .2686$ . A stronger association  $\chi^2(1, N = 98) = 4.47, p = .0344$  was evident when a history of abnormal cervical cytology results was examined. In evaluating the history of abnormal cervical cytology results, only reports of atypia, dysplasia, or CIN were considered "abnormal";

inflammation was not. Several gynecological infections also demonstrated significant differences with African-American women. Trichomonas infection  $\chi^2(1, N = 100) = 9.10, p = .0026$  and bacterial vaginosis infection  $\chi^2(1, N = 100) = 7.24, p = .0071$  were both considerably higher compared to Caucasians. Other gynecological infections occurred in higher percentages among African-Americans but were not tested because of small sample size.

#### Summary

Three research questions were addressed in this study. Almost 65% of women attending the two family planning clinics use tampons during menstruation and leave each tampon in the vagina for about three hours. While few women used tampons, douched, or used vaginal medications within the four days prior to cervical cytology testing, over half engaged in sexual intercourse. Recent tampon use, douching, sexual intercourse, and vaginal medication use prior to cervical cytology testing were not found to significantly increase abnormalities in the reported cytology results. A discussion of these findings will be addressed in the next chapter.

## CHAPTER 5 DISCUSSION AND CONCLUSION

### Discussion

The purpose of this research was to investigate tampon use patterns among women of childbearing age and determine the relationship of recent tampon use, douching, coitus, and vaginal medications to cervical cytology results in women of childbearing age. A discussion of the findings along with suggestions for further research will be presented in this chapter.

Almost two thirds of this sample reported tampon use, with Caucasians more likely to use tampons. Tampon use among African-Americans at 47.8% was consistent with earlier findings (Finkelstein & von Eye, 1990). Absorbancy choices and ethnicity had not previously been studied but in this study African-Americans were more likely to use higher absorbancies. TSS has been linked to higher absorbancy tampons and is more common among Caucasians. Are Caucasians using lower absorbancy tampons because of need or fear of TSS? Are African-Americans more at risk for TSS with the use of higher absorbancy tampons?

Tampon manufacturers recommend women change tampons every four to eight hours or more often as needed and use the lowest absorbancy necessary. The package insert warns that irritation could occur with frequent changing women are warned not to use tampons at times other than when menstruating. Women in this study changed tampons much more frequently than manufacturers recommend. One subject reported changing tampons hourly. It is unknown if women were changing tampons more frequently out of need or fear of TSS. Symptoms or problems related to frequent tampon changing were not addressed in this research though women who left tampons in longer had less abnormalities on cervical cytology results. This may suggest that frequent tampon changing may irritate cervical cells which later reflect as inflammation or other abnormalities on cervical cytology results.

None of the subjects reported using tampons at times other than during menstruation. This is heartening news since most of the ulcers reported occurred with prolonged use of tampons beyond the menstrual period (Barrett, Bledsoe, Greer, & Droegemueller, 1977; Jimerson & Becker, 1980). Generally speaking, these women are following the manufacturer's recommendations regarding tampon use.

Although recent tampon use was not shown to affect cervical cytology results, women who use tampons exclusively had a higher incidence of abnormalities on cervical cytology



results. The drying effects of tampons are well documented, though the most damage appears to be to the vaginal mucosa. Could some tampon brands be more likely to alter the cervix because of shape, composition, or whether the tampon expands lengthwise or widthwise? More research is needed to study the effect of tampons on the cervix that includes type of tampons. Many confounding variables exist, such as number of sexual partners and history of human papillomavirus, that may affect cervical cytology results. A larger sample may help define the role of tampons in affecting cervical cytology results.

Though not statistically significant, African-American women had a higher incidence of abnormalities in cervical cytology results. This study raises several questions related to feminine hygiene practices among this group. African-Americans used higher absorbancy tampons, were more likely to douche, had a higher incidence of gynecological infections, and used more deodorant tampons. Number of sexual partners and early age of first intercourse have been identified as increasing the risk of cervical dysplasia and carcinoma (Clarke, Hatcher, McKeown-Eyssen, & Lickrish, 1985; Fujimoto, Nemoto, Fukuda, Masubuchi, & Masubuchi, 1985). The number of lifetime partners was less than those reported by Caucasians and mean age at first intercourse was comparable in this study. Further study of African-American women,

particularly their feminine hygiene practices, and cervical cytology is suggested.

The feminine hygiene practices of the African-American women raise additional questions about cultural concepts related to female odors. African-Americans were more likely to use deodorant tampons and more likely to douche. Gentry (1991) found that African-American women douched more than Caucasians and generally learned about douching from their mother or other significant family and friends including boyfriends and their mothers. The most common reason cited for douching was hygiene or cleanliness but many of the woman also identified "clear up an odor". The use of deodorant tampons is essentially worthless because menstrual blood takes on odor after exposure to air. Are African-American women more likely to be concerned about odor? What message are we giving to women about normal female odors with the propagation of deodorant feminine hygiene products and how does this affect their self-image?

Culturally ingrained ideas related to feminine hygiene should be integrated into education programs focused on teaching women about their bodies and feminine hygiene. More knowledge about African-American women's beliefs about their bodies may be able to focus educational efforts and programs. A variety of mediums and the use of role models can help to publicize current information. One young black woman reported she quit douching following an Oprah Winfrey special

six months ago when leading gynecologists told the audience that douching was generally unnecessary and could be harmful. Publishing in more generally disseminated journals would reach a wider audience. Through integration of cultural beliefs and the results of research, health care providers may be able to help women make wise feminine hygiene choices.

The number of women who wear tampons, douche, or use vaginal medications in the four days prior to cervical cytology exam was low in this population. As stated previously, the number of women who douched was more than likely affected by the instructions given at the semi-rural clinic. The number of women who may have douched would have been higher if the pre-appointment instructions variable had been controlled. Women who were informed not to douche may not have been comfortable admitting douching prior to exam. Gentry (1991) found that 22% of a sample from a similar population reported douching prior to their exam while only 7% douched prior to exam in this study. Women using contraceptives, such as foam, diaphragm jelly, etc. may not have associated the contraceptive with medication usage.

The number of women having intercourse before cervical cytology screening was high. Over one third of the sample reported intercourse within 48 hours of cytology exam. Though cervical cytology results did not appear to be affected in this study, this researcher is concerned that

cervical trauma during intercourse or semen may affect cervical cytology results in a larger sample.

Vaginal medications that women used were primarily antifungal agents as reported by 23% of the sample. Whether the medication was prescribed or bought over-the-counter (OTC) was not addressed. With the availability of OTC vaginal medications, the use of these agents prior to cervical cytology screening may become more prevalent.

Over 50% of the subjects reported receiving no instructions prior to their cervical cytology smear exam. Women may not have received instructions or may have forgotten what instructions were given. Instructions related to douching consistent with those provided by the semi-rural clinic, i.e., no douching for 72 hours, were recorded by only 11 of the subjects. Instructions prior to exam and those reported by subjects are not consistent with recommendations in the literature (Kern, 1968; Murphy, 1990). Since none of the health behaviors appeared to affect cytology results, a question arises regarding the necessity of these instructions. Further research may answer this question.

### Conclusion

This study used a questionnaire and medical record review to examine tampon use and the relation of recent tampon use, douching, coitus, and vaginal medications to

reported cervical cytology results. Women in two north central Florida counties participated.

Tampons have been part of a woman's menstrual armament since 1936 and, until TSS in the 1980's, were considered safe and effective. Though rare, TSS is still a concern of researchers today along with the effect of tampons on the vaginal mucosa. With reported cervical ulcerations, cellular changes to the vaginal epithelium, and the higher incidence of cervical cytologic abnormalities among women who exclusively use tampons found in this study, a concern remains as to whether tampon use can increase the likelihood of abnormalities in cervical cytology smears.

Prior research and the results of this study indicate a need for menstrual product discussion with clients. This study raises many questions about feminine hygiene practices and the effects of these practices on cervical cytology. Douching as a practice has been linked with several gynecological problems and this study suggests that a large number of women in this population continue to douche. Frequent changing of tampons may increase cellular changes on the cervix and the relation of tampons to cervical cytology remains unclear. Continued research about feminine hygiene and cultural beliefs is recommended and can help guide education efforts. Information related to tampons, feminine

hygiene, and cervical cytology screening help to inform and encourage women to ask questions of their health care providers.

Though this study suggests that patient preparation instructions prior to cervical cytology screening may not be necessary, sufficient evidence was not presented to change current recommended instructions. Replication of this study with a much larger sample is recommended and currently being planned. Controlling for instructions given to subjects prior to cervical cytology screening would provide a more accurate picture of recent health behaviors and the relation between those factors and cervical cytology results.

## APPENDIX A

### DEMOGRAPHIC AND DATA COLLECTION SHEET

1. Age \_\_\_\_\_
2. Ethnic Origin 1 \_\_\_\_\_ Black 2 \_\_\_\_\_ White  
3 \_\_\_\_\_ Hispanic 4 \_\_\_\_\_ Oriental 5 \_\_\_\_\_ Other
3. Education \_\_\_\_\_ years
4. Number of pregnancies \_\_\_\_\_
5. Age at first pregnancy \_\_\_\_\_

### TAMPON USE

6. What type of product do you use during your menstrual period?  
1 \_\_\_\_\_ tampons 2 \_\_\_\_\_ tampons and pads 3 \_\_\_\_\_ pads
- If you answered either 1 or 2 in Question #6, continue on in this section.
- If you answered 3 in Question #6, please skip to Question #14.
7. What type of tampon do you use:  
1 \_\_\_\_\_ Regular 2 \_\_\_\_\_ Super 3 \_\_\_\_\_ Super Plus
  8. Do you use deodorant tampons? 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no
  9. How long do you usually leave a tampon in? \_\_\_\_\_ hours
  10. What is the longest amount of time that you usually leave one tampon in? \_\_\_\_\_
  11. Do you use tampons at times other than when you are having your menstrual period? 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no
  12. If so, for what reason(s): \_\_\_\_\_
-

13. Describe your usual pattern of tampon and/or pad use.
- 1 \_\_\_\_\_ tampons only during entire menstrual period
  - 2 \_\_\_\_\_ tampons during heavy days, pads during light days
  - 3 \_\_\_\_\_ tampons during the day, pads during the night
  - 4 \_\_\_\_\_ tampons and pads together
  - 5 \_\_\_\_\_ other, please describe \_\_\_\_\_
- 

PAP SMEAR PREPARATION

14. How long has it been since you last used a tampon?
- 1 \_\_\_\_\_ within the last 24 hours
  - 2 \_\_\_\_\_ 2 days ago
  - 3 \_\_\_\_\_ 3 days ago
  - 4 \_\_\_\_\_ 4 days ago
  - 5 \_\_\_\_\_ longer than 4 days
  - 6 \_\_\_\_\_ don't wear tampons
15. Do you douche? 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no
16. How long has it been since you last douched?
- 1 \_\_\_\_\_ within the last 24 hours
  - 2 \_\_\_\_\_ 2 days ago
  - 3 \_\_\_\_\_ 3 days ago
  - 4 \_\_\_\_\_ 4 days ago
  - 5 \_\_\_\_\_ longer than 4 days
  - 6 \_\_\_\_\_ don't douche
17. How long has it been since you last had sexual intercourse?
- 1 \_\_\_\_\_ within the last 24 hours
  - 2 \_\_\_\_\_ 2 days ago
  - 3 \_\_\_\_\_ 3 days ago
  - 4 \_\_\_\_\_ 4 days ago
  - 5 \_\_\_\_\_ longer than 4 days
  - 6 \_\_\_\_\_ are not sexually active
18. How long has it been since you last used any medications in your vagina?
- 1 \_\_\_\_\_ within the last 24 hours
  - 2 \_\_\_\_\_ 2 days ago
  - 3 \_\_\_\_\_ 3 days ago
  - 4 \_\_\_\_\_ 4 days ago
  - 5 \_\_\_\_\_ longer than 4 days
  - 6 \_\_\_\_\_ have not used vaginal medications
19. Medication used? \_\_\_\_\_
20. How many sexual partners have you had in the last year?  
\_\_\_\_\_



21. Total lifetime number of sexual partners? \_\_\_\_\_
22. How old were you when you first had sexual intercourse?  
\_\_\_\_\_
23. Do you smoke? 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no
24. How much? 1 \_\_\_\_\_ less than 1/2 pack per day  
2 \_\_\_\_\_ about 1 pack per day  
3 \_\_\_\_\_ about 1 1/2 packs per day  
4 \_\_\_\_\_ about 2 packs per day  
5 \_\_\_\_\_ over 2 packs per day  
6 \_\_\_\_\_ other, please describe \_\_\_\_\_
- 
25. How long have you smoked? \_\_\_\_\_
26. What instructions were you given regarding your pap smear when you made your appointment?  
1 \_\_\_\_\_ no instructions  
2 \_\_\_\_\_ no douching or sex for 24 hours prior to appointment  
3 \_\_\_\_\_ no douching, tampons, or sex for 24 hours prior to appointment  
4 \_\_\_\_\_ no douching, tampons, or sex for 48 hours prior to appointment  
5 \_\_\_\_\_ other  
If other, please describe: \_\_\_\_\_
- 
- 

## CHART REVIEW

27. History of HPV: 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no  
\_\_\_\_\_ year dx
28. History of PID: 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no  
\_\_\_\_\_ year dx
29. History of Chlamydia: 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no  
\_\_\_\_\_ dates dx
30. History of Trichomonas: 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no  
\_\_\_\_\_ dates dx
31. History of Gonorrhea: 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no  
\_\_\_\_\_ dates dx

32. History of Syphilis: 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no  
\_\_\_\_\_ dates dx

33. History of B. vaginosis: 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no  
\_\_\_\_\_ dates dx

34. Other: 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no  
\_\_\_\_\_ dates dx

35. Abnormal Pap smears 1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no

36. Class/Year \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

37. Method use to obtain current Pap smear:  
1 \_\_\_\_\_ Cytobrush 2 \_\_\_\_\_ Ayre spatula 3 \_\_\_\_\_ other  
\_\_\_\_\_

38. Specimen adequate (contains endocervical cells)  
1 \_\_\_\_\_ yes 2 \_\_\_\_\_ no

39. Results of current Pap smear: \_\_\_\_\_  
\_\_\_\_\_

40. Results of current N. gonorrhea smear: \_\_\_\_\_

41. Results of current wet smear: \_\_\_\_\_

42. Results of additional tests done at time of pap smear:  
\_\_\_\_\_  
\_\_\_\_\_

## APPENDIX B

### INFORMED CONSENT

Title: The Relation of Recent Tampon Use, Douching, Coitus, and Vaginal Medications to Reported Cervical Cytology Results in Women of Childbearing Age

Project Director: Maryann Kulpa, BSN, Graduate Student

You are being asked to be part of a study that is being done to find out about tampon use and what women do to be ready to have their Pap smear. Women in north Florida are being asked to participate.

I would like you to fill out a questionnaire that will take about 10 minutes to finish, and then I would like you to let me look at your medical chart. Only information about Pap smear testing will be looked at. Your name or any numbers that would identify you will not be placed in your chart or on the questionnaire. All information about you will be kept private.

Sometimes patients are given instructions to prepare them for having a Pap smear. I would like to learn more about whether these instructions may affect the Pap smear results. This information may be helpful in obtaining more accurate results from these tests.

#### RISKS

There are no risks in being part of this study. Your care will be the same whether you are part of the study or not.

#### BENEFITS

There is no gain to you directly if you participate in this study. However, you may feel good knowing that you may provide information that will improve the quality of Pap smear results.

You have the right to be fully informed of this study and have all of your questions answered. If you have any questions, you may call Maryann Kulpa at (904) 331-6409 if no

researcher is available at the clinic. Please feel free to ask any questions about this study. You may withdraw from the study at any time without penalty or withholding of services.

Thank you for your participation.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness

## REFERENCES

- Ayre, J. E. (1947). Selective cytology smear for diagnosis of cancer. American Journal of Obstetrics and Gynecology, 53(4), 609-617.
- Barrett, K. F., Bledsoe, S., Greer, B. E., & Droegemueller, W. (1977). Tampon-induced vaginal or cervical ulceration. American Journal of Obstetrics and Gynecology, 127(3), 332-333.
- Brinton, L. A., Hamman, R. F., Huggins, G. R., Lehman, H. F., Levine, R. S., Mallin, K., & Fraumeni, J. F., Jr. (1987). Sexual and reproductive risk factors for invasive squamous cell cervical cancer. Journal of the National Cancer Institute, 79(1), 23-30.
- Brooks-Gunn, J. & Ruble, D. N. (1982). Psychological correlates of tampon use in adolescents. Annals of Internal Medicine, 96(Part 2), 962-965.
- Campion, M. J. & Reid, R. (1990). Screening for gynecological cancer. Obstetrics and Gynecology Clinics of North America, 17(4), 695-727.
- Clarke, E. A., Hatcher, J., McKeown-Eyssen, G. E., & Lickrish, G. M. (1985). Cervical dysplasia: Association with sexual behavior, smoking, and oral contraceptive use? American Journal of Obstetrics and Gynecology, 151(5), 612-616.
- Clay, L. S. (1990). Midwifery assessment of the well woman. The pap smear. Journal of Nurse-Midwifery, 35(6), 341-349.
- Colbry, S. L. (1992). A review of Toxic Shock Syndrome: The need for education still exists. Nurse Practitioner, 17(9), 39-43.
- Farley, D. (1991). TSS. Reducing the risk. FDA Consumer, 25(8), 31-33.
- Finkelstein, J. W. & von Eye, A. (1990). Sanitary product use by white, black, and Mexican American women. Public Health Reports, 105(5), 491-496.

- Friedrich, E. G. Jr. (1981). Tampon effects on vaginal health. Clinical Obstetrics and Gynecology, 24(2), 395-406.
- Friedrich, E. G. Jr., & Siegesmund, K. A. (1980). Tampon-associated vaginal ulcerations. Obstetrics & Gynecology, 55(2), 149-156.
- Fujimoto, I., Nemoto, H., Fukuda, K., Masubuchi, S., & Masubuchi, K. (1985). Epidemiologic study of carcinoma in situ of the cervix. Journal of Reproductive Medicine, 30(7), 535-540.
- Gardner, J. W., Schuman, K. L., Slattery, M. L., Sanborn, J. S., Abbott, T. M., & Overall, J. C., Jr. (1991). Is vaginal douching related to cervical carcinoma? American Journal of Epidemiology, 133(4), 368-375.
- Gentry, S. E. (1991). Vaginal douching practices of women attending a family planning clinic in north central Florida. Master's thesis, University of Florida, Gainesville.
- Himes, N. E. (1963). Medical history of contraception. New York: Gamut Press.
- Irwin, C. E., Jr. & Millstein, S. G. (1982). Predictors of tampon use in adolescents after media coverage of toxic shock syndrome. Annals of Internal Medicine, 96(Part 2), 966-968.
- Jimerson, S. D. & Becker, J. D. (1980). Vaginal ulcers associated with tampon usage. Obstetrics and Gynecology, 56(1), 97-99.
- Kern, G. (1968). Preinvasive carcinoma of the cervix (R. Wynn, Trans.). New York: Springer-Verlag.
- Kovar, W. R., Giblin, H. J., & Roddy, J. M. (1959). Vaginal tampons and their relationship to the cervix uteri as determined by roentgenography. Obstetrics and Gynecology, 13(3), 269-272.
- Lauver, D. & Rubin, M. (1991). Women's concerns about abnormal Papanicolaou test results. Journal of Obstetrical, Gynecological, and Neonatal Nursing, 20(2), 154-159.
- Mandelblatt, J. (1989). Cervical cancer screening in primary care: Issues and recommendations. Primary Care, 16(1), 133-155.

- Murphy, P. A. (1990). Laboratory testing. In R. Lichtman & S. Papera (Eds.), Gynecology. Well-woman care (pp. 41-54). Norwalk, CT: Appleton & Lange.
- Niv, J., Lessing, J. B., Hartuv, J., & Peyser, M. R. (1992). Vaginal injury resulting from sliding down a water chute. American Journal of Obstetrics and Gynecology, 166(3), 930-931.
- Osterholm, M. T., Davis, J. P., Gibson, R. W., Forfang, J. C., Stolz, S. J., Vergeront, J. M., & The Investigative Team. (1982). Toxic shock syndrome: Relation to catamenial products, personal health and hygiene, and sexual practices. Annal of Internal Medicine, 96(6, Pt. 2), 954-958.
- Papanicolaou, G. N. & Traut, J. F. (1941). The diagnostic value of vaginal smears in carcinoma of the uterus. American Journal of Obstetrics and Gynecology, 42(2), 193-206.
- Raudrant, D., Frappart, L., DeHaas, P., Thoulon, J. M., & Charvet, F. (1989). Study of the vaginal mucus membrane following tampon utilisation: Aspect on colposcopy, scanning electron microscopy and transmission electron microscopy. European Journal of Obstetrics & Gynecology and Reproductive Biology, 31(1), 53-65.
- Reelick, N. F., de Haes, W. F. M., & Schuurman, J. H. (1984). Psychological side-effects of the mass screening on cervical cancer. Social Science Medicine, 18(12), 1089-1093.
- Sackren, H. S. (1939). Vaginal tampons for menstrual absorption. Clinical Medicine & Surgery, 46(8), 327-329.
- Singer, A. (1975). The uterine cervix from adolescence to menopause. British Journal of Obstetrics and Gynaecology, 82(2), 81-99.
- Thornton, M. J. (1943). The use of vaginal tampons for the absorption of menstrual discharges. American Journal of Obstetrics and Gynecology, 46(2), 259-265.
- Weissberg, S. M. & Dodson, M. G. (1983). Recurrent vaginal and cervical ulcers associated with tampon use. Journal of the American Medical Association, 250(11), 1430-1431.
- Wheatley, R. E., Menkin, M. F., Bardes, E. D., & Rock, J. (1965). Tampons in menstrual hygiene. Journal of the American Medical Association, 192(8), 113-116.

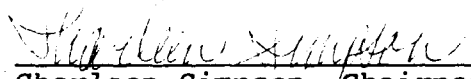
## BIOGRAPHICAL SKETCH

Maryann Kulpa received her Bachelor of Science in Nursing degree from Southeastern Massachusetts University in May 1978. She was commissioned as a Second Lieutenant in the United States Air Force in December 1978. During her military career she has performed in a variety of hospital nursing areas including general medical/surgical, pediatrics, critical care, and maternal and infant care.


She was inducted into membership in the Alpha Theta Chapter of Sigma Theta Tau International Honor Society of Nursing and is a member of both the Florida Nurses Association and the National Officer Association. She is currently a Major in the United States Air Force.




I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Science in Nursing.

  
Sharleen Simpson, Chairperson  
Associate Professor of Nursing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Science in Nursing.

  
Sandra F. Seymour  
Associate Professor of Nursing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Science in Nursing.

  
Hossein Yarandi  
Associate Professor of Nursing

This thesis was submitted to the Graduate Faculty of the College of Nursing and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Master of Science in Nursing.

August, 1993

\_\_\_\_\_  
Dean, College of Nursing

\_\_\_\_\_  
Dean, Graduate School